

## What are our priorities?

The National Institute for Occupational Safety and Health (NIOSH) Engineering Controls Program seeks to protect workers by removing hazardous conditions or by placing a barrier between the worker and the hazard. The program works with partners in industry, labor, trade associations, professional organizations, and academia on these areas among others:

- Reducing worker exposures to silica dust in mining, construction and at oil & gas extraction sites.
- Reducing worker exposures to hazardous drugs in healthcare and veterinary medicine.
- Reducing worker asphalt fume exposure for roofers and pavers.
- Providing engineering control recommendations to protect workers from emerging hazards.
- Reducing food processing worker exposures to hazardous airborne flavoring chemicals.
- Reducing potential worker exposures to infectious diseases in healthcare and emergency services.

## What do we do?

- Increase awareness and use of silica dust controls and practices for work tasks linked to silica exposure.
- Promote the use of engineering controls for silica and asphalt fume to U.S. and international industry partners, regulatory agencies and consensus standard bodies.
- Develop and test engineering controls for dust, chemicals, and noise exposures.
- Recommend specific NIOSH-engineered controls for emerging hazards in nanotechnology, robotics, and advanced manufacturing methods such as 3D printing.
- Evaluate the effectiveness of engineering controls to protect health care and veterinary workers from exposure to hazardous drugs.
- Design and evaluate engineering solutions to reduce infectious diseases in healthcare and emergency services.

## What have we accomplished?

- Assisted 19 [coffee roasting and packaging facilities](#) to improve engineering controls to reduce worker exposures to diacetyl and 2,3-pentanedione.
- Published a NIOSH topic page on [Closed System Drug-Transfer Devices](#) to protect healthcare workers from occupational exposure to hazardous drugs.
- Published research findings showing that high levels of surface disinfection can be achieved in ambulance patient modules with [ultraviolet germicidal irradiation systems](#).
- Published research findings showing that bricklayers' exposures to respirable crystalline silica during mortar removal (part of the task known as tuckpointing) can be reduced by using other [tools](#) or [supplement grinders](#).
- Published recommendations that can be used by employers, employees, and other stakeholders to reduce the crystalline silica exposures of workers fabricating and [installing stone countertops](#).
- [Presented](#) on safe handling of hazardous drugs for veterinary workers during the monthly CDC Zoonoses & One Health Updates (ZOHU) Call. The presentation reached over 10,000 ZOHU subscribers.
- Published [field study results](#) of emissions, exposures, and engineering control from industrial-scale 3D printers.
- Published a NIOSH Mining [Program Information Circular](#) on the *Design, Testing, and Modeling of Environmental Enclosures for Controlling Worker Exposure to Airborne Contaminants*.

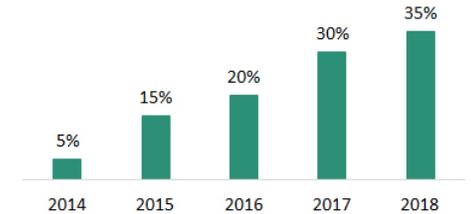
## What's next?

- Develop effective engineering control solutions to reduce worker exposures to styrene and other volatile organic compounds associated with cured-in-place piping work.
- Develop a technology so that 3D printers can 3D print their own engineering control to reduce ultrafine particle emissions.
- Develop and implement control strategies to reduce aerosol and volatile organic compound exposures that cause asthma and interstitial lung disease in dental personnel.

## At-A-Glance

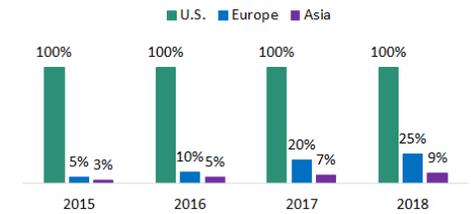
The NIOSH Engineering Controls Program seeks to protect workers through engineering interventions that can be used to eliminate or allow safe work around hazards. This snapshot shows recent accomplishments and upcoming work.

Approximate percentage of asphalt milling machines in the U.S. fitted with engineering controls for silica



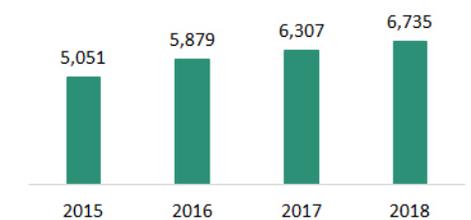
Source: National Asphalt Pavement Association

Approximate percentage of global highway class asphalt pavers fitted with engineering controls for asphalt fumes



Source: National Asphalt Pavement Association, NIOSH program records, and the Institut National de Recherche et de Securite (INRS) program records

Cumulative downloads of NIOSH Publication-Nanomaterial Production and Downstream Handling Processes



Source: NIOSH Program Records

## Publication Spotlight:

Controlling Health Hazards When Working with Nanomaterials: Questions to Ask Before You Start			
HAZARD	DRY POWDER (Typically highest potential for exposure)	SUSPENDED IN LIQUID	PHYSICALLY BOUND/ ENCAPSULATED (Typically lowest potential for exposure)
<b>TOXICITY</b>	Applies to the Nanomaterials: Highly reactive particles; Strongly hygroscopic; High surface area; High surface energy; High surface reactivity; High surface area; High surface energy; High surface reactivity.	Applies to Nanomaterials exposed to liquid: High potential for exposure (spraying, open top, inhalable misting); Lower potential for exposure (handling in a well-ventilated enclosure).	Applies to Physically Bound/Encapsulated Nanomaterials: High potential for exposure (spraying, grinding, cutting, drilling, sanding, finishing, breaking, etc.); Lower potential for exposure (removal, handling, and cleaning with wet methods).
<b>TOXICITY</b>	Applies to the Nanomaterials: Low potential for exposure; Low surface area; Low surface energy; Low surface reactivity.	Applies to Nanomaterials exposed to liquid: Low potential for exposure (closed system, low surface area, low surface energy, low surface reactivity); High potential for exposure (open top, inhalable misting, spraying, etc.).	Applies to Physically Bound/Encapsulated Nanomaterials: Low potential for exposure (closed system, low surface area, low surface energy, low surface reactivity); High potential for exposure (open top, inhalable misting, spraying, etc.).
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To learn more, visit  
[www.cdc.gov/niosh/programs/eng/default.html](http://www.cdc.gov/niosh/programs/eng/default.html)

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